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(54) **Muzzle cover for fire tube arms.**

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Muzzle cover for fire tube arms

The present invention relates to a muzzle cover for weapons having a barrel through the muzzle of which a shell or a similar projectile is intended to be launched, whereby the muzzle cover comprises a collar which is pushed over the exterior muzzle end of the barrel and which carries a diaphragm which is integral with the collar and connected thereto by a weakened portion of slightly less thickness than the diaphragm so that the diaphragm can be broken away from the collar through the action of the pressure appearing in the barrel when the shell or similar projectile is launched, thereby leaving a free passageway for the shell.

When handling such weapons, especially when the marksman moves, there is a risk that gravel, sand and other particles enter the barrel thereby preventing the shell from leaving the barrel bore, what may have disastrous consequences. Previously known muzzle covers made of sheet metal or any other stiff material have to be removed before the weapon is fired since otherwise there is a risk that the fire tube explodes before the shell has left the barrel, or that the shell is actuated while penetrating the muzzle cover so that the shell gets another shooting angle than the intended one.

In order to make sure that the muzzle cover is not damaged and that no particles have entered the barrel the marksman has to inspect the muzzle cover before shooting, and the muzzle cover must be removed, and preferably also the inner of the barrel must be inspected. This is a time consuming operation which reduces the possibility for the marksman to quickly start the shooting.

A muzzle cover is previously known from the DE-B-1.016.603 which comprises a collar mounted on the exterior side of the barrel and a muzzle end which is connected to the collar over an annular portion of reduced strength so that the muzzle end is broken away and is removed from the collar when the projectile is fired.

It is important to make sure that the muzzle end is safely and fully removed when the projectile is fired since even small obstacles may change the shooting direction of the projectile. Therefore the strength of the annular connection portion of said previously known muzzle cover has to be rather low and as a consequence there is a risk that the muzzle end is unintentionally broken, partly or completely, so that gravel, sand or dust may enter the barrel.

According to the present invention the muzzle end is connected to the collar over a weakened portion having substantially increased strength as compared with that of the said known muzzle cover, and the muzzle end is made as a diaphragm which is outwardly concave, and the weakened portion is shaped like a ring that connects the diaphragm to the

collar and has an outwardly convex bow-formed profile. Thereby the pressure wave obtained when the weapon is fired forces the diaphragm from its position inwards to a position convexly outwards, and the stress thereby obtained in the material of the muzzle cover assists in breaking the diaphragm as a whole away from the collar along the said weakened portion.

Now the invention shall be described more in detail with reference to the accompanying drawings. In the drawings Figure 1 is an example of a weapon system with a barrel having a muzzle cover according to the invention, and Figure 2 is an axial cross section through a separate muzzle cover.

The weapon illustrated in Figure 1 generally comprises a weapon part 1 having a firing apparatus 2 and a sight 3, and an ammunition part 4 including a barrel 5, a combustion chamber 6 and a funnel formed end nozzle 7. At the rear end of the barrel 5 a non-illustrated shell is pre-mounted and the firing of the shell is made by a non-electric fuse 8 extending from the firing apparatus 2 into the shell. On the barrel a combined shoulder support-cheek support 9 and a support cushion 10 are mounted. The support cushion 10 is a support for the barrel while resting on the shoulder of the marksman when shooting from a standing or knee standing position.

At the muzzle the barrel has a muzzle cover 11 which like the shell is mounted in connection to the manufacture of the ammunition part 4. Therefore the barrel is never left without a muzzle cover, and the muzzle cover is allowed to remain on the barrel when the shell is launched.

The muzzle cover is made of an elastic material, preferably rubber or synthetic rubber, and as best evident from Figure 2 the muzzle cover comprises a collar 12 which is intended to be mounted outside the barrel 5 and which carries a diaphragm 13. Preferably the collar 12 is slightly conically widened from the diaphragm 13 and it has an average diameter which is slightly less than the outer diameter of the barrel 5 so that the muzzle cover has to be pressed on the barrel 5. At the connection portion between the collar 12 and the diaphragm 13 the muzzle cover is preferably formed with a shoulder 14 which provides a supporting edge to the front edge of the barrel. The shoulder 14 has a slightly less radial dimension than the thickness of the barrel so as not to provide an obstacle for the shell while being launched from the barrel. The transition portion between the collar 12 and the diaphragm 13 is formed as a recess 15 which provides a kerf for blowing the diaphragm 13 out when launching the shell. For this purpose the recess 15 has slightly less thickness than the remaining part of the diaphragm. The dia-

phragm 13 has to be completely free from stresses both in order to stand stresses from outside and to be able to provide a clamping of the collar 12 to stick to the barrel when launching the shell. Therefore the diaphragm 13 is concavely bent inwards whereas the recess 14 is bent outwards. In order to provide a good clamping of the collar to the outside of the barrel when launching the shell the collar 12 is made gradually thinner towards the rear free end thereof.

In a practical embodiment of the muzzle cover according to the invention for a fire tube having an inner diameter of 85 mm the collar 12 of the muzzle cover was made with a largest thickness round the barrel of 5 mm, whereas the diaphragm 13 was made having a thickness of 0.75 mm. The recess 15 was formed with a thickness of 0.4 mm. The diaphragm 13 was made concavely inwards with the largest concavity of 5—8 mm.

The muzzle cover can be glued or vulcanized or secured in any other way to the barrel 5, but depending on the conical and special form of the collar 12 it may be quite sufficient that the collar 12 is pressed onto the muzzle of the fire tube without any further securing means.

When making the weapon ready for shooting it is quite sufficient that the marksman slightly hits the diaphragm 13 whereby a specific resonance sound appears in the barrel. If the muzzle cover is undamaged whereas another sound appears if the muzzle cover should happen to be punctured. Therefore the marksman can quickly and effectively judge whether or not the muzzle cover is undamaged or not. If the muzzle cover is undamaged the shell is launched, and depending on the pressure thereby appearing in the barrel the diaphragm 13 is blown out and is ruptured round the recess 15 thereby leaving a free race for the shell. Depending on the stress when the diaphragm is pressed out from its concave to a convex form there is some floating of material in the collar 12 at the same time as the collar 12 by the pressure is rotated outwards-rearwards round the shoulder 14, whereby the collar is pressed stronger to stick to the barrel. This prevents the collar from being released and thereby from inflicting the throw path of the shell.

It is to be understood that the muzzle cover described above and shown in the drawings is only an illuminating example and that all kinds of different modifications may be presented within the scope of the appended claims.

- 1 weapon part
- 2 firing apparatus
- 3 sight
- 4 ammunition part
- 5 barrel
- 6 combustion chamber
- 7 end nozzle
- 8 non-el. fuse
- 9 shoulder—cheek support

- 10 support cushion
- 11 muzzle cover
- 12 collar
- 13 diaphragm
- 14 shoulder (of 11)
- 15 recess

Claims

1. Muzzle cover for weapons having a barrel (5) through the muzzle of which a shell or a similar projectile is intended to be launched, whereby the muzzle cover (11) comprises a collar (12) which is pushed over the exterior muzzle end of the barrel and which carries a diaphragm (13) which is integral with the collar and connected thereto by a weakened portion (15) of slightly less thickness than the diaphragm so that the diaphragm can be broken away from the collar (12) through the action of the pressure appearing in the barrel when the shell or similar projectile is launched, thereby leaving a free passageway for the shell, characterized in that the diaphragm (13) is outwardly concave, and in that the weakened portion (15) is shaped like a ring that connects the diaphragm to the collar and has an outwardly convex bow-formed profile.

2. Muzzle cover according to claim 1, characterized in that the collar (12) is formed with a shoulder (14) providing a support edge for the muzzle cover to the barrel end and which is narrower than the thickness of the barrel.

3. Muzzle cover according to claim 1 or 2, characterized in that the collar (12) is slightly conically widened from the outer end thereof and rearwardly, and in that the average diameter of the collar is less than the outer diameter of the barrel (5).

4. Muzzle cover according to any of the preceding claims, characterized in that the collar (12) has a successively reduced thickness of material in the direction rearwardly.

Patentansprüche

1. Mündungsdeckel für Feuerwaffen mit einem Rohr (5), durch dessen Mündung eine Granate oder ein ähnliches Projektil abgefeuert werden soll, wobei der Mündungsdeckel (11) eine über das äußere Mündungsende des Rohrs aufschlebbare Hülse (12) aufweist, die eine mit der Hülse integrale Membran (13) trägt, welche mit der Hülse über eine Schwachstelle (15) etwas geringerer Stärke als die Membran verbunden ist, so daß die Membran unter Wirkung des im Rohr beim Abfeuern der Granate oder eines ähnlichen Projektils auftretenden Drucks von der Hülse (12) abgerissen wird, wodurch ein freier Durchlaß für die Granate entsteht, dadurch gekennzeichnet, daß die Membran (13) nach außen konkav ist und daß die Schwachstelle (15) als Ring ausgebildet ist, der die Membran mit der Hülse verbindet und ein nach außen konvex gekrümmtes Profil hat.

2. Mündungsdeckel nach Anspruch 1, dadurch gekennzeichnet, daß die Hülse (12) eine als Anschlagkante für den Mündungsdeckel am Rohrende dienende Schulter (14) aufweist, die enger als die Dicke des Rohrs ist.

3. Mündungsdeckel nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Hülse (12) von ihrem Außenende und nach hinten leicht konisch erweitert ist und daß der mittlere Durchmesser der Hülse kleiner als der Außendurchmesser des Rohrs (5) ist.

4. Mündungsdeckel nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Hülse (12) nach hinten hin eine zunehmend verringerte Materialstärke hat.

Revendications

1. Couver-bouche pour armes comportant un canon (5) à travers la bouche duquel un obus ou un projectile similaire doit être lancé, le couver-bouche (11) comprenant une bague (12) qui est poussée sur l'extrémité de bouche extérieure du canon et qui porte un diaphragme (13) réalisé d'une seule pièce avec la bague et relié à celle-ci par une partie affaiblie (15) d'épaisseur légèrement inférieure à celle du diaphragme afin que

le diaphragme puisse être séparé par rupture de la bague (12) sous l'action de la pression apparaissant dans le canon lorsque l'obus ou projectile similaire est lancé, laissant ainsi un passage libre pour l'obus, caractérisé en ce que le diaphragme (13) est concave vers l'extérieur et en ce que la partie affaiblie (15) est d'une forme analogue à celle d'une bague qui relie le diaphragme à la bague et qui possède un profil de forme bombée, convexe vers l'extérieur.

2. Couver-bouche selon la revendication 1, caractérisé en ce que la bague (12) est réalisée avec un épaulement (14) constituant un bord d'appui pour le couver-bouche sur l'extrémité du canon, et qui est plus étroit que l'épaisseur de canon.

3. Couver-bouche selon la revendication 1 ou 2, caractérisé en ce que la bague (12) est légèrement élargie coniquement à partir de son extrémité extérieure et vers l'arrière, et en ce que le diamètre moyen de la bague est inférieur au diamètre extérieur du canon (5).

4. Couver-bouche selon l'une quelconque des revendications précédentes, caractérisé en ce que la bague (12) présente une épaisseur de matière qui diminue de façon progressive vers l'arrière.

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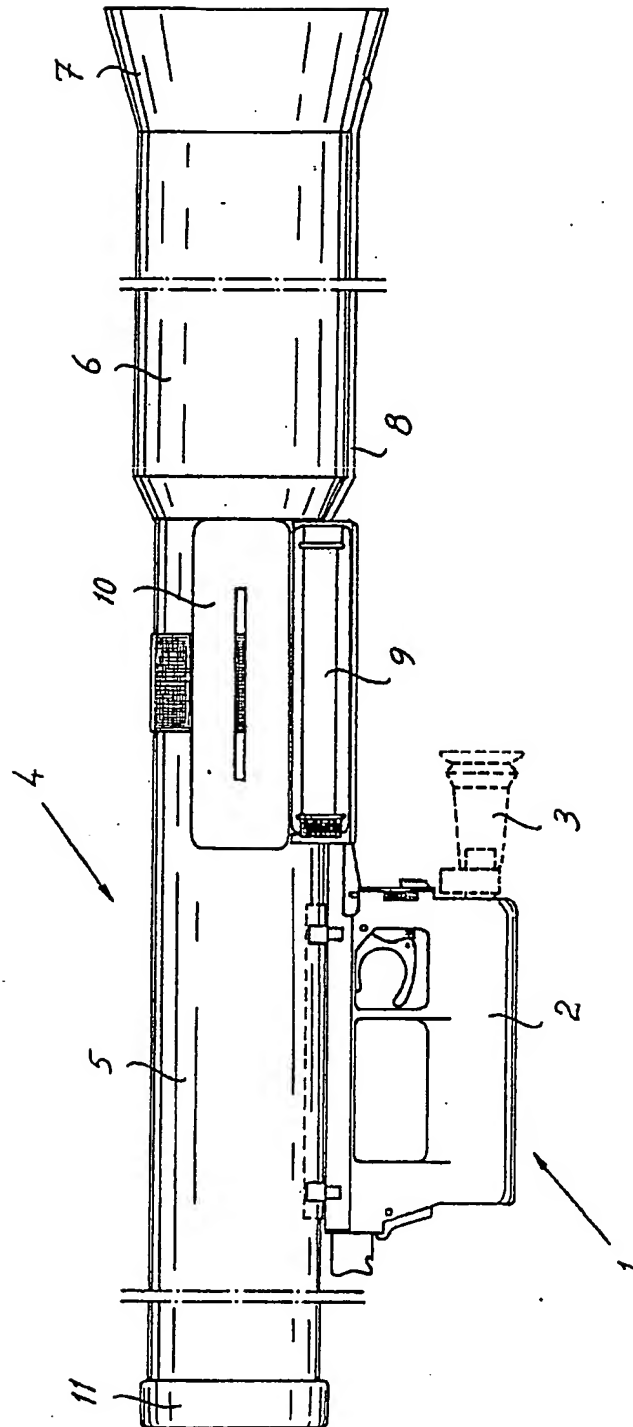


FIG. 1

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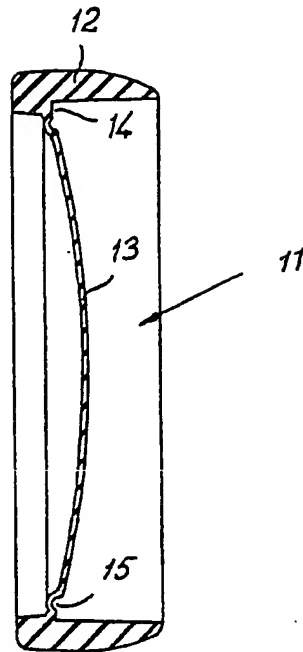


FIG. 2